Working Paper Series, Paper No. 11-10

Trust, Trustworthiness, Relational Goods and Social Capital: A Cross-Country Economic Analysis

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May 2011

Abstract

For a sample of 34 countries, this paper examines the impact that relational goods have on trust and, more specifically, trustworthiness; that is the degree of trust placed in others. Relational goods emanate from social interactions, which can be viewed as underpinning the development of social capital in the sense of helping to form trust in society. The relational goods examined comprise both informal activities such as meeting with family and friends, as well as more formal but voluntary association connected with participation in cultural, political, civic, sport and religious organisations. As the measure of trust comprises an ordered variable, a variety of ordered estimators are applied to the data, including attempts to account for the country-specific grouping of observation and, as a consequence, unobserved heterogeneity. The results suggest that whilst informal relational activities tend to generate trustworthiness, consistent with the concept of 'thick' trust, along with cultural and civic association and frequent political association, there is less evidence that sports does. In addition, the results suggest that religious association can actually reduce trustworthiness along with less frequent political association. Therefore, the results suggest, that it is the type and frequency of associational activity that contributes to the development of trustworthiness, rather than its existence per se.

JEL Classification Codes: D60, I31, C25

***Key Words*:** Trust, relational goods, social capital

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1. Introduction

There is a growing economic literature analysing trust in society. Seminal contributions argue that trust can help to facilitate a more efficient exchange of resources because of, for example, the presence of incomplete contracts (Arrow, 1972). More recently, it has been argued that trust can promote economic growth because it represents the formation of social capital through social interactions and associative behaviour (Ben-Ner and Halldorsson, 2010; Kugler *et al,* 2007; Glaeser *et al,* 2000, Knack and Keefer, 1997, Fukuyama, 1995). However, there is a developing debate about this possibility. Initially, Olson (1982) identified negative consequences from associational activity deriving from agents' identifying with particular groups with the likely consequent promotion of special interests. This can limit benefits to wider society and the promotion of growth, because of lobbying for preferential policies.[1] In contrast, Putnam (1993) argues that associational activity can promote growth because it encourages cooperation, solidarity and public spiritedness. More recently, Roth (2009) has argued that the presence of these potentially opposite impacts could be rooted in the initial levels of trust held by societies. Activities that promote trust from initial positions of low trust, will promote economic growth, but not if the initial levels of trust in society are high.

In this paper, rather than assessing the impacts of trust, the emphasis is upon the production of trust from associational activity. Cross-country evidence is presented to explore the factors affecting trust and, in particular, trustworthiness, which is the degree of trust placed in others. The particular contribution of the paper is to examine how, using micro data of individual activity across countries, different forms of association, and the frequency with which it takes place, affects trustworthiness.[2] Both informal activities such as meeting with family and friends, as well as more voluntary

[1] Earlier contibutions such as James (1904) and Loury (1977) identified social capital with the ability of an individual to do well in social situations. The literature referred to subsequently in this paper, conceptualises social capital as a group-level, not individual-level entity.

[2] At this point it should be emphasised that the causal claims made in this paper are weak because of its cross-sectional emphasis, and it focuses on types of associational activity across countries. Unlike papers taking a country level and aggregate perspective of the relationships between trust, economic growth and other social institutions, suitable panel data do not exist for exploring individual participation in associational activity across countries (Roth, 2009; Bergh and Bjønrnskov, 2010).

association connected with participation in, cultural, political, civic, sports and religious organisations are investigated.[3] As discussed below, the previous literature has tended to focus on the formal, legal and institutional bases of trust, or assumed *a priori* which types of association have particular affects on trust. The results of this paper suggest that whilst informal relational activities tend to generate trustworthiness, along with cultural and civic association and frequent political association, there is less evidence that association through sports does. In addition, the results suggest that religious association can actually reduce trustworthiness along with less frequent political association. This suggests strongly that it is the type of associational activity and aspects of its frequency that contributes to the development of trustworthiness and hence social capital, rather than its existence *per se*. Policy proclamations about the efficacy of voluntary activity in producing social cohesion, thus need to be grounded in more detailed and targeted understanding of such impacts.[4]

To address these issues, the paper proceeds as follows. Section 2 examines the definitions and measurement of trust in economics, and hence why this paper investigates trustworthiness as a dimension of this, how the economic literature examines social interactions and associative behaviour, and then the formation of different types of social capital. Section 3 presents the data used in the analysis, and Section 4 the empirical methods employed. Because of the ordered nature of the measurement of trustworthiness, and that international cross-section data are examined, a variety of ordered estimators are applied to the data. These include attempts to account for the country-specific grouping of observations and, as a consequence, unobserved heterogeneity. Results are presented and discussed in Section 5 and conclusions then follow in Section 6.

2. Literature Review

There are two main ways in which trust has been investigated in economics. The first follows Berg *et al's* (1995) experimental approach, which has used primary data to test

[3] As discussed further below, different dimensions of trust may be associated with these activities.

[4] This suggests that, for example, rather general policy pronouncements such as the current UK coalition government's advocacy of a 'Big Society' based upon localised voluntary action raising social welfare need to be refined and grounded in much more detailed analysis of the evidence

the predictions of the 'trust game' (see, for example, Kugler, *et al* 2007 for an extension of the analysis from individuals to groups). The second has been to examine secondary data for an empirical assessment of either how trust affects economic growth, or other macroeconomic performance indicators, or to explore the factors which affect statements about trust in large-scale surveys. The current research draws upon both of these elements of the literature. Whilst, the second research approach is the one utilised in this paper, as it explores the determination of trust, , the literature in the first approach illustrates the theory of trust, and how it is formed, and which is needed to interpret empirical results. Consequently, it is this analysis of trust that is reviewed first.

In the trust game an individual 'A' sends another individual 'B' a hypothetical proportion of an assumed endowment. 'B' is informed that they receive a multiple of this amount and they are also informed that they can return to 'A' any amount, less than or equal to the amount that they received. 'A' thus receives the initial endowment plus the net receipts from the transfers to and from 'B'. In this game it is argued that the amount that 'A' transfers to 'B' is a measure of trusting behaviour. How much 'A' is prepared to trust 'B'. In contrast the amount returned from 'B' to 'A' is a measure of the trustworthiness of 'B', that is, can 'B' actually be trusted by 'A'. In game theoretic terms this presents trust as a voluntary transfer to someone, with expected but not guaranteed reciprocity. One might expect that a one-shot game would reveal no trustworthiness and reciprocity as there are no reputational effects, that is costs to 'B' in capturing the transfer in full. Despite this, it has been shown experimentally that trustworthiness is common and this has been linked to the formation of social capital (Chaudhuri *et al,* 2002).

Such results are not necessarily criticism of the game-theoretic perspective. As argued by Gunnthorsdottir *et al* (2002), 'other-regarding' acts can be viewed as investments in reputation *per se*. Investing trust in others produces a trustworthy return. It seems likely that the experimental results reveal that in practice, with social interactions, agents retain the view that there is always the possibility that they may meet the other agent with whom they are trading again. It can also be argued that the reputational effects from reciprocity have externalities that spill over to other activities and

interactions with other agents as well. It has long been recognised in economics that individuals can invest not only in human capital, but also reputation through social interactions. For example, Manski (2000) argues that the mechanisms by which social interactions can occur have long been explored in economics. The most traditional formats have been through either the preferences of agents being directly affected by the consumption of others (Veblen, 1934; Duesenberry, 1949; Liebenstein, 1950) or through the expectations of agents stemming from rational and adaptive mechanisms (Cyert and March, 1963; Tverskey and Kahneman, 1974 and Lucas, 1976).

In the former case, with externalities providing the mechanism by which interactions occur, the theoretical foundations were more formally developed in Becker (1974). Here it is recognised that agents can invest in social characteristics as part of their social environment, which is part of the wealth of individuals. Important features of Becker's analysis are that the economic agent is a consumer-producer of the goods and services yielding utility, and that all externalities stemming from the benefits of accruing social characteristics are effectively internalised. Cauley and Sandler (1980) generalised the analysis to one in which the consumption of other agents affects the ability of agents to produce the goods that they ultimately consume. This implies that the Coase Theorem does not have to hold, that is that agents take full account of their interactions with others, which is implied in Becker (1974). In contrast, a series of possibilities exist in which the Coase Theorem result, or no account being taken by individuals of interactions, are special cases. In general, the outcomes depend on the extent of bargaining between agents and their awareness of spillovers.

It seems clear that club-goods, in which voluntary groups derive benefit from sharing production costs, the members' characteristics, or a good characterised by excludable benefits, can be seen as naturally building upon such interactions (Cornes and Sandler, 1986). Likewise, one might view such activity as producing relational goods – that is associated with the non-instrumental and experiential dimensions of the activities of economic agents (Gui, 2000). This is because relational goods might be expected to be linked most closely to associations of both a formal and informal nature. However, expressed it can be seen that club goods or relational goods are inherently produced

from social interactions and as such capture elements of reciprocity and trustworthiness (Chaudhuri *et al* 2002).

That trust – and its dimensions - underpin social capital is made clearer in considering the origins of the concept of social capital from Fukuyama (1995), Bordieu (1997), Coleman (1994) and Putnam (1993, 2000). Fukuyama (1995) argues that trust is literally the manifestation of social capital and this facilitates the efficiency of organisations. For example, in situations of low-trust, relationships tend to be limited to the restricted family or ethnic group. Horizontal organizations, such as guilds, unions, and clubs are formed less easily and strong hierarchies tend to emerge. Consequently, it is argued that hierarchical religions, like the Catholic Church, have historically hampered spontaneous economic sociability and integration.

For Bordieu (1997) social capital is linked to the building of durable networks of relationships for elites for their mutual advantage. In this regard social capital is linked directly to the accumulation of economic and cultural capital, that is the economic, knowledge and skill resources possessed by individuals respectively. Coleman (1994) by contrast does not view social capital as something that helps to reproduce an elite but, rather, the family and community relationships and organisation that affect the ability of individuals to develop their human capital. Resonating with Bourdieu's cultural capital, this is identified with the education, employment skills and expertise possessed by individuals.

The economic literature has tended to emphasise the foundational contribution of Putnam (1993, 2000) and Fukuyama (1995). The former conceptualises social capital as the property of aggregate structures, such as communities, cities or regions, which are held together by networks. Of direct relevance for this paper is that like Fukuyama (1995), Putnam (1993, 2000) emphasises how trust, developed through social capital, helps to make communities and societies more efficient by reducing the need for formal forms of transaction such as contracts, or formal exchange of ideas, information and resources, but at the same time enables the collective pursuit of objectives. In this respect, Putnam also places more emphasis on organised social groups than, say Bordieu (1997) or Coleman (1994). Further, it is maintained that varieties of

organisations may affect social capital differently and that a distinction between bonding and bridging capital should be made. The former promotes homogeneity between those of similar characteristics and familiarity. In contrast, bridging capital links heterogeneous groups and individuals. This echoes Fukuyama's distinction between horizontal and vertical association. What is distinct about Putnam (1993, 2000) is that it is recognised that there can be tension between the impacts of these forms of social capital formation. For example, Putnam (2000) argues that a decline in social capital can be charted by examining the decline in organised US league bowling, and the growth of commercial recreational bowling and organisation. The decline in social capital is as a result of both the reduction of the regularity and sustained meeting of acquaintances, but also through that associated with acquaintances of a *diverse* character. In this respect it might be expected that associations that reinforce similarity may raise bonding social capital and trust, but may reduce bridging capital and trust. It is, of course, the latter characteristic of voluntary associations that is implicitly emphasised by Olson (1982).

Collectively such seminal literature suggests that different types of association may affect social capital and trust differently. It is in this respect that this paper examines the impact of both informal activities such as meeting with family and friends, as well as more formal association connected with participation in cultural, political, civic, sports and religious organisations. To borrow Putnam's terminology the literature suggests that if views of the trustworthiness of others reduce through associative activity then division is encouraged and, at best, bonding capital might dominate bridging capital. In contrast, if views of the trustworthiness of others increases through associative activities then they are promoting bridging capital and, also bonding capital.

As discussed earlier, as well as the game theoretic analysis of trust, an empirical literature has developed analysing trust as measured on surveys such as the General Social Survey, or the World Values Survey through an ordered scale. On the scale respondents indicate whether or not they can trust other people or indicate degrees by which 'they can't be too careful in dealing with them'. This is also the case in the current research as discussed in Section 3. The main direction of the literature, as noted in the

introduction, has been to examine the impacts of trust on economic performance, with some literature examining the determinants of trust.

For example, trust has been shown to provide a positive impact on government effectiveness, civic and organisational performance and social efficiency, linked to issues such as infrastructure quality, high school completions and infant mortality, by La Porta *et al* (1997), for a sample of 40 countries. Helliwell and Putnam (1995) show that more developed civic communities in Italian regions had higher growth rates, whilst Knack and Keefer (1997) show that both trust and civic cooperation had large effects on growth for a sample of 29 countries. Temple and Johnson (1998) identify that trust has a positive effect on the growth of a sample of 74 developing countries. Finally, Zak and Knack (2001) analyse a sample of 41 countries for a series of cross sections for 1981 - 1984, 1990 - 1993 and 1995 - 1997 (of the World values Survey) and identify that trust is positively associated with growth and investment.

Significantly, Knack and Keefer (1997) and Temple and Johnson (1998) distinguish between associations that might help to develop bonding rather than bridging social capital, as argued by Olson (1982), and those that might also bridge different groups as argued by Putnam (1993). *A priori,* it is argued that associations which may reduce trust - Olson-type associations – include trade unions, political parties and professional organisations. In contrast it is argued that Putnam-type associations, which may raise trust, include youth, religious and education, arts and cultural associations. The papers find support for the differential effects on growth that these forms of association entail.[5] The differential impact of trust on growth has been more recently addressed by Roth (2009), as indicated in the introduction. Also examining 41 countries over a series of waves of the World Values Survey and Eurobarometer data, it is identified that for countries starting with low initial levels of trust, increases in trust add to economic growth. This is not the case for countries with high initial levels of trust. Other research, such as Bergh and Bjørnskov (2011) show that for a cross-section sample of countries

[5] Temple and Johnson (1998) also find strong impacts of a multidimensional social development index on economic growth. Olson-type groups have no significant impact on growth for Knack and Keefer (1997), rather than a negative effect.

in 2008, it is levels of trust that can be associated with the provision of a larger welfare state. This is explained by trust helping to overcome free-rider problems.

As part of this literature, some attempt has also been made to measure the determinants of trust. Further to exploring the impact of trust on economic growth, Knack and Keefer (1997) identify that Olson-type associations reduce trust, whereas Putnam-type associations raise trust. Likewise, Zak and Knack (2001) identify that property rights, contract enforceability, corruption perceptions, investor rights, as measures of formal institutions; together with Gini coefficient measurements of income and land ownership inequalities, and ethnic homogeneity, as measures of 'social distance' in the population, are significant determinants of trust. The emphasis in this research was more on formal institutional determinants of trust as indicated by Putnam (2000) and Newton (1997).

The fact that different analyses of trust draw upon different forms of interaction between agents raises the important question of what is actually measured in such surveys. The literature distinguishes between the 'thick' trust that is associated with family networks. It is argued that other interpersonal relationships, or generalised trust, are generated by looser secondary social relations. Finally it is argued that systemic or institutional trust is captured in legal arrangements (Roth, 2009). Clearly dimensions of each of these aspects of trust might be captured in a survey question, and consequently indicated by significant statistical relationships between trust and some specific measures of the factors that are theorised to determine it.

Yet more fundamental issues are at stake in considering what is captured by questions about trust, once one recognises from the trust game that two aspects of trust are evident in reciprocity. In a comprehensive study of survey measurements, Glaeser *et al* (2000) argue that trustworthiness, rather than trusting, as defined earlier, is captured by typical survey questions and it is upon this strict basis that such questions measure an ingredient of social capital as a meaningful individual-level variable. Futher, it is argued that this dimension of trust, essentially *experienced* through *interactions,* is distinct from deeper elements of trust and trustworthiness which, as argued by Uslaner (2002, 2008a,b) have a *moralistic* foundation. Such moralistic trust would be developed,

for example, through childhood socialisation, and consequently exist relatively independently of specific social interactions and remain relatively stable over the lifetime.[6]

From an empirical perspective this means that one might expect to observe different levels of trust persisting between agents, despite their individual trust *per se* being moderated by experiences through interactions. Reflecting such an idea, much of the literature, argues that different nationalities might exhibit persistent higher levels of trust, such as is observed in the Scandinavian countries, or ethnic groups within countries (Bergh and Bjønrnskov, 2010). Another important feature of Uslaner's work is that it argues that (moralistic) trust involves more than just belonging to a civic, religious or educational group but the undertaking of good deeds such as charitable giving and volunteering when engaging with people who are different. There are strong echoes with the concept that trust requires investment in bridging social capital, as with Putnam. Drawing upon this literature, therefore, this paper seeks to analyse the determinants of trustworthiness, as generated by family networks and forms of more informal and non-contractual association, and their consequent formation of social capital, for a cross-section of countries according to the frequency of association.

3. Data

The data employed in this analysis draw on the International Social Survey Programme (ISSP), which is a collaborative survey programme that currently comprises 46 member countries. Data are collected on a variety of social, economic and environmental themes. Data from 2007 are employed because in this year sports and leisure activities were investigated through a Leisure Time and Sports module. As sports often comprise the greatest level of voluntary and associative behaviour, this provided the best opportunity to assess the widest possible range of associative activities (Downward *et al,* 2009). In the current research, therefore, a sample size of 49,730 is obtained from 34 of the 36 participant countries.[7]

[6] An important feature of Uslaner's work is that it argues that (moralistic) trust involves more than just belonging to a civic group, but good deeds such as charitable giving and volunteering.

[7] At the time of writing data from Denmark and the Netherlands was not available.

In this data, the variable describing generalized trust in society – which as discussed above essentially measures trustworthiness - is employed as a dependent variable for social capital. The variable is measured on a 4-point scale (*1=people can always be trusted to 4=people cannot be trusted at all*).[8] It is assumed, that interpersonal differences in this variable might be explained due to differences in the engagement in relational activities, such as various groups and associations. Consequently, a series of covariates measure participation in cultural, civic, church, sport and political groups and associations, to explore the affects of these activities on the creation of social capital. Getting together with relatives and friends are also included as explanatory variables because of the obvious pleasure that might be enjoyed while undertaking these more informal relational activities, and as discussed above, it is identified that they are an important feature of trusting relationships. As with the dependent variables these covariates are measured on ordinal scales, so getting together with family and friends, are recoded into four dummies each indicating (*1=daily, 2=several times a week, 3=several times a month, 4=several times a year*) the corresponding engagement in these activities. Participation in cultural, civic, political, sport and church groups or associations is recoded as four dummies but with different meanings, reflecting the different periodicity that is measured (*1=at least once a week, 2= at least once a month, 3=several times a year, 4=once or twice a year*).

To control for other variations in both life experiences as well as economic circumstances, socio-demographic characteristics of individuals are also included as explanatory variables. These include *age* in years, age^2, gender (*sex*: 1=male, 0 = female), household size (*hsize*), years of education (*eduyear*), marital status (*couple*, *divorced*, *separated*, *widowed*, reference category: *single*), income, as well as employment status (full time employment: *ftemp*, part time employment: *ptemp*, *retired*, housewife or man: *keephouse*, *unemployed*, reference category- other employment: *otheremp*). Variable definitions and descriptive statistics are given in Table 1.

The treatment of income in the current research required some manipulation because the data on income referred to either months or annual values. Further, different

[8] The order of the dependent variable has been reversed in our analysis in order to make the intepretation of the regression results more intuitive, where a higher number indicates higher trust.

countries either collected income data gross of tax or net of tax. To cope with this complexity two strategies were adopted. In one case all country-specific incomes were transformed into a net annual US dollar purchasing power equivalent income estimates. This involved three sets of calculations. The first entailed dividing all income estimates by the country-specific purchasing power parity exchange rate (PPP), which is given with local currency units per international dollar and obtained from the United Nations' webpage. In a second step, monthly income was multiplied by 12 to obtain annual income for all countries but Australia, Great Britain, Ireland, Japan, Norway, New Zealand, Slovakia and the United States of America in which annual income was already presented. Finally, for some countries the income estimates had to be transformed from gross into net values. Using data from national statistics offices' home pages, and identifying the gross domestic product (GDP) as gross income in an economy, a tax rate 't' was calculated as the ratio of a countries' annual income tax revenues to their GDP. Net incomes were generated by multiplying gross incomes from the actual data by a factor calculated as '1' minus the implied tax rate, 't'. This generated a net annual US dollar purchasing power equivalent income estimate

To check the robustness of this transformation, a second strategy involved using standardized measures of each country's income series to remove differences in the levels and variances of the differently recorded incomes. As this produced incomes that could vary across zero, a dummy variable was also constructed to be scored '1' whenever 'negative' income was recorded and was also included in the regression analysis with the standardized income measures to check for the sign of effects. The standardised measures produced extremely similar results and thus are omitted for economy of presentation.[9]

4. Estimators

To account for the fact that the trust variable is an ordinal variable, ordered estimators were employed. Following Greene and Hensher (2010), the ordered probit model can be understood as based upon the random utility model which, for individual *i* is:

[9] In all of the results which follow only the former income measure is presented. The standardised measures produced extremely similar results and thus are omitted for economy of presentation. They are available on request.

$$y_i^* = \beta' x_i + \varepsilon_i, i = 1,..., N. \quad (1)$$

In this equation the dependent variable represents the underlying random utility, or latent variable, in which continuous latent utility y_i^* is observed in discrete form through the censoring mechanism:

$$\begin{aligned} y_i &= 0 \ \ if\ \mu_{-1} < y_i^* \le \mu_0, \\ &= 1 \ \ if\ \mu_0 < y_i^* \le \mu_1, \\ &= 2 \ \ if\ \mu_1 < y_i^* \le \mu_2, \\ &= \ldots \\ &= J \ \ if\ \mu_{J-1} < y_i^* \le \mu_J. \end{aligned} \quad (2)$$

The vector x_i is a set of K covariates that are assumed to be strictly independent of ε_i; β is a vector of K parameters. The thresholds divide the range of utility into cells that are then identified with the observed ratings of trust.

The existing literature applying ordered choice models has tended to concentrate empirical discussion upon estimated coefficients.[10] The absolute values of the estimated parameters, however, do not have much explanatory value on their own due to scale differences. The effect of a change in one of the variables in the model depends on all the model parameters, the data, and which probability (cell) is of interest. Therefore, one possibility is to compute partial effects to give the impact on the specific probabilities associated with each category of the dependent variable per unit change in the covariate. The partial effects in the ordered choice model are expressed as

$$\delta_i(x_i) = \frac{\partial \Pr ob(y = j \mid x_i)}{\partial x_i} = [f(\mu_{j-1} - \beta' x_i) - f(\mu_j - \beta' x_i)]\beta \quad (3)$$

When the utility function is linear in parameters, it might be regarded that a positive (negative) coefficient is connected with a reduction (increase) in the probability in the

[10] In much of the literature discussed above versions of linear models tend to be used.

lowest cell and an increase (reduction) in the probability in the highest cell of the dependent variable. With the single crossing feature of the model, such that some probabilities fall and some rise as the value of a covariate changes, one can imply that probabilities have shifted in a particular direction. Therefore, the sign of the partial effect of the highest cell of the ordered dependent variable will coincide with that of the covariate indicating the direction of the effect (Greene and Hensher, 2010).

Because of the possibility that the distribution of trust may vary across countries, as for example driven by moralistic trust, because of national preferences or cultural relativities and, indeed simply because of sampling across different countries, three further specifications were estimated than simply the ordered choice model (see, for example, Wooldridge, 2009). Both random effects (RE) and fixed effects (FE) ordered models were used to control for the country of observation being a grouping variable.[11] The final specification involved estimating the ordered model allowing for clustering of the standard errors within countries. This adjusts the variances because of correlation between the observations in a cluster, reflecting the sampling strategy, and producing latent heterogeneity (Greene, 2008).

5. Results

Results from all of the regressions are presented in Table 2. The broad columns of the table present results for the basic ordered model, the random effects model, the fixed effects model, and the ordered model with clustered standard errors respectively. In each of these columns three sets of data are presented: coefficient estimates, t-statistics, used to assess their significance, and the partial effects as discussed above. Significance is indicated for each coeffcient as ***, ** or * for the 1%, 5%, or 10% levels respectively. The partial effects presented are for the highest value of the trust variable for each covariate. Because of missing values across the covariates the sample size on which estimation takes place is 31,825 observations. The missing values also mean that the

[11] In general fixed effects are to be preferred over random effects. In the random effects context the impact of the country effects can be established with reference to a rho (ρ) statistic $\rho = \sigma c^2/\sigma c^2+\sigma_{ic}^2$ where *c* is a country specific variance and *ic* a random variance across individuals and countries. ρ>0 suggests correlations of errors of individuals in any country. Because of the likely endogeneity between country effects and the covariates FE models are generally preferred (Wooldridge, 2009)

countries Russia, Sweden, Hungary, Slovenia and GB have to be omitted from the analysis.

The results presented in Table 2 show that for the socio-economic covariates there is some variance in the effects for age and age squared and being divorced. The ordered model and its version with clustered errors suggest significant quadratic and negative effects for these variables respectively, but this is not the case for either panel estimator. This suggests that the relationships between ageing and trust, and perhaps feelings of vulnerability from being divorced leading to reduced feelings of trust are country-specific. Clearly different countries might provide different support systems to cope with the impact of ageing and separation.

In contrast, positive robust impacts of years of education, being in education and levels of income on trust are identified across all specifications. Further, negative robust impacts on trust of household size and being bereaved are identified. These results suggest, respectively, that education and income, as generally indicative of human and economic capital, also produce, as indicated in the literature review, social capital. However, it might be the case that having children or dependents in the household, which increases its size, generates a more general sense of vulnerability or lack of trust in others, as does the loss of a partner.

Some support for these latter comments are suggested in considering the informal relational goods of associating with family and friends. These generate broadly robust and positive effects on trust with the highest marginal effects being observed for more regular associations. This is despite insignificant results for daily contact with either for the fixed effects specification, and daily association with relatives according to the random effects specification. On balance these results suggest strong evidence that informal associations raise social capital through trust as argued in the literature.

In contrast, some variation in results is, identified for more formal associations connected with cultural, church, civic, sport and political groups, though once again a broad finding is that more frequent association has the largest effect for any given type of association. Taking the ordered and clustered ordered models first, generally significant and positive effects are identified for all periodicities of association and

across all types of association with the exception of politics and associations via the church. In the former case the most frequent political association, probably reflecting strong political attachment perhaps associated with being an activist, generates trust. In contrast, less frequent association with a political group is associated with reduced trust. It is probably the case that such associations are connected more with protestation about a specific issue and hence discontent. These results are also broadly shared with the panel data estimates, though the likely protest effect only shares the sign and the not statistical significance. Such results indicate that the earlier literature that identifies the creation or not of social capital with the type of association *per se* is subject to qualification. In the case of the church, generally negative impacts on social capital are identified. Initially this seems to be counter intuitive until one recognises that strongly identified faith groups are likely to reinforce bonding rather than bridging capital. The same qualitative results, if not general levels of significance for periodicities of association, are identified for the panel estimators for all but the most frequent associations through churches. A significant and positive sign for the random effects estimator and an insignificant but positive sign for the fixed effects estimator give the suggestions that allowing for variations across countries regular church going *may* also be connected with bridging social capital. There is intuition in these results in that more frequent church association is likely to be connected with 'devout' behaviour, as opposed to some form of instrumental connection with a church association., It may, therefore, be expected to be connected with a sentiment of seeking harmony across communities. Such results are consistent with Anderson *et al* (2010) who find little general support for the view that religious people exhibit greater 'other regarding' sentiment. These results indicate that the intuition that politics and religion are potentially forces for both social cohesion and division has some support.

Standing in direct contrast to these results is associative behaviour connected with civic and cultural activities. These have ubiquitously positive effects on trust. The only difference between the estimates is that the fixed effects results have some insignificant effects for some periodicities. Broadly this positive effects is not surprising as such activities are almost inherently connected with 'tastes' and the enhancement of society. There would almost by definition be less scope in such activities to create division in society and mistrust.

The final set of results to discuss concern sport. For the ordered and clustered ordered models there is consistent evidence that engagement in sports associations raises trust. However, these results all but disappear for the panel estimators except for the most infrequent case of sports association in the fixed effects estimator, and for a low level of significance. This suggests that the impact of sport on trust in society may well be more country-specific than general. This is perhaps not surprising as sports often vary across countries despite purporting to share common values and they are often identified with national interests and well-being (Downward *et al* 2009, Kavestsos and Szymanki, 2010). The implication for policy is that to the extent that sport is identified with national identities then this might suggest challenges for multicultural societies and the use of sport to promote multi-national social capital, of which small-scale research has already indicated (Bradbury, 2010).

6. Conclusion

In this paper cross-country evidence is presented to explore the impact of relational goods on the formation of trust and, in particular, trustworthiness, which is the degree of trust placed in others. In this way, the particular contribution of the paper is to examine how both the type and frequency of non-contractual social interaction has increased or reduced social capital. . Both informal activities such as meeting with family and friends, as well as more formal association connected with participation in, cultural, political, civic, sports and religious organisations are investigated. The results suggest that whilst informal relational activities tend to generally promote feelings of trustworthiness, along with cultural and civic association, there is less evidence that other forms of association generally promote trust. Sports association may be most closely identified with national levels of trust. In addition, the results also suggest that religious association may or may not reduce trust, as with political association. The latter results coincide with anecdotal thinking that politics and religion can be both socially divisive and cohesive. In this respect, and unlike the existent literature in which it is assumed that certain types of association can reduce or increase trust, it is argued that it is both the type of voluntary association and its frequency that can be identified with the formation of trustworthiness and the development of social capital. Policies that look to build growth or national well-being upon increased associational activity

thus requires more detailed analysis of the context, rather than the assumption that voluntary association has positive social welfare impacts.

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Table 1: Variable description (GESIS, 2009, own calculations).

Variables	Description	mean (s.d.)
Dependent		
Trust	Degree of trust Ordinal (1=people can always be trusted...4=people can never be trusted)	
Sport / Leisure		
Physical activity	*Reference category: never*	
Spdaily	Dummy (1=take part: daily, 0=else)	.149 (.357)
Spweek	Dummy (1=take part: several times a week, 0=else)	.253 (.435)
Spmonth	Dummy (1=take part: several times a month, 0=else)	.183 (.387)
Spyear	Dummy (1=take part: several times a year, 0=else)	.121 (.326)
Sporting event	*Reference category: never*	
Spevdaily	Dummy (1=attend as a spectator: daily, 0=else)	.012 (.111)
Spevweek	Dummy (1=attend as a spectator: several times a week, 0=else)	.046 (.210)
Spevmonth	Dummy (1=attend as a spectator: several times a month, 0=else)	.122 (.327)
Spevyear	Dummy (1=attend as a spectator: several times a year, 0=else)	.280 (.449)
Sports group	*Reference category: never*	
Spgdaily	Dummy (1=participation: at least once a week, 0=else)	.090 (.287)
Spgweek	Dummy (1=participation: at least once a month, 0=else)	.056 (.231)
Spgmonth	Dummy (1=participation: several times, 0=else)	.068 (.252)
Spgyear	Dummy (1=participation: once or twice, 0=else)	.070 (.254)
Cultural group	*Reference category: never*	
Cultgpwe	Dummy (1=participation: at least once a week, 0=else)	.027 (.162)
Cultgpmo	Dummy (1=participation: at least once a month, 0=else)	.046 (.210)
Cultgpse	Dummy (1=participation: several times, 0=else)	.075 (.264)
Cultgpon	Dummy (1=participation: once or twice, 0=else)	.100 (.300)
Civic group	*Reference category: never*	
Civicgow	Dummy (1=participation: at least once a week, 0=else)	.032 (.177)
Civicgpm	Dummy (1=participation: at least once a month, 0=else)	.053 (.223)
Civicgps	Dummy (1=participation: several times, 0=else)	.078 (.269)
Civicgpo	Dummy (1=participation: once or twice, 0=else)	.109 (.312)
Political group	*Reference category: never*	
Polgpwee	Dummy (1=participation: at least once a week, 0=else)	.008 (.087)
Polgpmon	Dummy (1=participation: at least once a month, 0=else)	.018 (.131)
Polgpsev	Dummy (1=participation: several times, 0=else)	.031 (.173)
Polgponc	Dummy (1=participation: once or twice, 0=else)	.048 (.215)
Church groups	*Reference category: never*	
Chchgpwe	Dummy (1=participation: at least once a week, 0=else)	.097 (.296)
Chchgpmo	Dummy (1=participation: at least once a month, 0=else)	.063 (.243)
Chchgpse	Dummy (1=participation: several times, 0=else)	.091 (.289)
Chchgpon	Dummy (1=participation: once or twice, 0=else)	.102 (.302)
Relatives	*Reference category: never*	
Relatdai	Dummy (1=participation: daily, 0=else)	.055 (.229)
Relatwee	Dummy (1=participation: several times a week, 0=else)	.190 (.392)
Relatmon	Dummy (1=participation: several times a month, 0=else)	.373 (.484)
Relatyea	Dummy (1=participation: several times a year, 0=else)	.322 (.467)
Friends	*Reference category: never*	
Friendai	Dummy (1=participation: daily, 0=else)	.108 (.311)
Frienwee	Dummy (1=participation: several times a week, 0=else)	.265 (.442)
Frienmon	Dummy (1=participation: several times a month, 0=else)	.365 (.482)
Frienyea	Dummy (1=participation: several times a year, 0=else)	.184 (.387)
Socioeconomic		
Income	Metric (net income per person)	20,052 (28,475)
Age	Metric (age of respondents)	45.89 (17.36)
Age^2	Metric (age of respondents squared)	
Sex	Dummy (1=man, 0=else)	.450 (.497)

Hsize	Metric (size of household)	3.210 (1.783)
Eduyear	Metric (years of education)	11.867 (3.752)
Marital status	*Reference category: single*	
Couple	Dummy (1=partnership, 0=else)	.551 (.497)
Divorced	Dummy (1=divorced, 0=else)	.067 (.250)
Separated	Dummy (1=separated, 0=else)	.025 (.155)
Widowed	Dummy (1=widowed, 0=else)	.086 (.280)
Employment status	*Reference category: unemployed*	
Ftemp	Dummy (1=full time employment, 0=else)	.454 (.498)
Ptemp	Dummy (1=half time employment, 0=else)	.110 (.313)
Retired	Dummy (1=retired, 0=else)	.180 (.385)
Keephouse	Dummy (1=housewife or man, 0=else)	.088 (.283)
Illnotwork	Dummy (1=unemployed through illness, 0=else)	.018 (.132)
Otheremp	Dummy (1=other employment, 0=else)	.023 (.151)

Table 2: Estimation results

	Ordered Probit model			Random Effects Ordered Probit model		
	Coeffs	**t-stats**		**Coeffs**	**t-stats**	**MEs**
Constant	0.00347	0.05		.93951***	10.39	
SEX	0.00120	0.09	0.00012	-0.00341	-0.20	-0.00023
AGE	-0.00132	-0.53	-0.00013	-0.00137	-0.46	-0.00009
AGESQ	.60443D-04**	2.39	0.00001	.42771D-04	1.45	0.00000
HHOLDSIZ	-.03222***	-8.43	-0.00329	-.01619***	-3.67	-0.00111
COUPLE	-0.01733	-0.94	-0.00177	0.00160	0.07	0.00011
WIDOW	-.13002***	-4.28	-0.01211	-.07394**	-2.00	-0.00495
DIVORCED	-.06172**	-2.15	-0.00603	-0.03142	-0.90	-0.00213
SEPARATE	-0.05602	-1.42	-0.00547	0.03099	0.73	0.00215
EDUCYEAR	.03424***	18.50	0.00349	.02171***	10.03	0.00149
FTEMP	0.00765	0.18	0.00078	0.02298	0.49	0.00158
PTEMP	0.04197	0.95	0.00440	0.02831	0.55	0.00196
UNEMP	-0.05709	-1.23	-0.00560	-0.02912	-0.56	-0.00198
EDUC	.17870***	3.13	0.02094	.12604**	2.04	0.00904
RETIRED	-0.04962	-1.09	-0.00493	0.01374	0.25	0.00095
KEEPHOUS	-0.05087	-1.13	-0.00502	-0.01451	-0.26	-0.00099
ILLNOTWO	-0.02305	-0.35	-0.00231	0.10826	1.38	0.00773
INCOME1	.00479***	19.65	0.00049	.00173***	13.41	0.00012
RELATDAI	.27345***	7.33	0.03400	-0.02516	-0.66	-0.00171
RELATWEE	.26968***	8.96	0.03162	.24533***	7.79	0.01783
RELATMON	.21666***	7.60	0.02320	.18804***	6.48	0.01314
RELATYEA	.17455***	6.11	0.01878	.18437***	6.51	0.01297
FRIENDAI	.14582***	4.75	0.01635	.12198***	3.65	0.00867
FRIENWEE	.26582***	9.95	0.03014	.19487***	6.18	0.01384
FRIENMON	.29575***	11.38	0.03239	.19642***	6.31	0.01375
FRIENYEA	.20060***	7.27	0.02274	.15126***	4.38	0.01076
SPGPWEEK	.15239***	6.75	0.01724	0.03580	1.30	0.00248
SPGPMONT	.11016***	3.91	0.01218	0.02787	0.85	0.00193
SPGPSEV	.09346***	3.60	0.01019	0.03555	1.07	0.00247
SPGPONCE	.09800***	3.89	0.01072	0.03648	0.94	0.00253
CULTGPWE	.19797***	5.08	0.02353	.82760***	20.55	0.07540
CULTGPMO	.16498***	5.25	0.01903	.06971*	1.77	0.00490
CULTGPSE	.14931***	5.87	0.01691	.08693**	2.50	0.00613
CULTGPON	.16422***	7.39	0.01867	.08313**	2.55	0.00585
CHCHGPWE	-.12789***	-5.79	-0.01199	.84277***	29.58	0.07422
CHCHGPMO	-.17423***	-6.62	-0.01567	-.10550***	-3.08	-0.00698
CHCHGPSE	-.07994***	-3.53	-0.00773	-0.03666	-1.24	-0.00249
CHCHGPON	-.04330**	-2.02	-0.00429	-0.02476	-0.76	-0.00169
CIVICGPW	.10221***	2.82	0.01128	.11679***	2.89	0.00835
CIVICGPM	.12723***	4.29	0.01443	.07106*	1.94	0.00499
CIVICGPS	.13946***	5.59	0.01567	.14920***	4.91	0.01073
CIVICGPO	.09307***	4.36	0.01008	.08743***	2.98	0.00615
POLGPWEE	.14693**	2.06	0.01687	.22966***	3.20	0.01715
POLGPMON	0.03134	0.65	0.00328	.08227*	1.75	0.00581
POLGPSEV	-.08466**	-2.32	-0.00809	-.07068*	-1.75	-0.00472
POLGPONC	0.01891	0.64	0.00196	0.06766	1.55	0.00475
Mu(1)	1.18717***	154.73		2.18227***	331.76	
Mu(2)	2.61634***	221.33		4.59510***	684.26	
Sigma				1.65859***	147.72	

Table 2 Continued: Estimation results

	Fixed Effects Ordered Probit model			Ordered Probit Model (+Cluster)		
	Coeffs	**t-stats**	**ME**	**Coeffs**	**t-stats**	**ME**
Constant	n.a.	n.a.		0.00347	0.04	
SEX	-0.01483	-0.61	-0.00154	0.00119	0.08	0.00012
AGE	-0.00258	-0.61	-0.00027	-0.00132	-0.46	-0.00013
AGESQ	.52638D-04	1.23	0.00001	.60443D-04**	2.08	0.00001
HHOLDSIZ	-.01879***	-2.81	-0.00195	-.03222***	-5.96	-0.00329
COUPLE	-0.02001	-0.61	-0.00208	-0.01733	-0.81	-0.00177
WIDOW	-.09088*	-1.76	-0.00886	-.13003***	-3.79	-0.01211
DIVORCED	-0.0263	-0.54	-0.00268	-.06173**	-1.97	-0.00603
SEPARATE	0.05494	0.85	0.00595	-0.05603	-1.2	-0.00547
EDUCYEAR	.01843***	5.65	0.00191	.03424***	13.55	0.00349
FTEMP	0.05636	0.81	0.00586	0.00765	0.17	0.00078
PTEMP	0.05544	0.75	0.00596	0.04197	0.9	0.0044
UNEMP	-0.00642	-0.08	-0.00066	-0.05709	-1.08	-0.0056
EDUC	.15542*	1.67	0.01818	.17870***	2.66	0.02094
RETIRED	0.06114	0.8	0.00656	-0.04962	-0.98	-0.00493
KEEPHOUS	-0.01271	-0.17	-0.00131	-0.05087	-1.04	-0.00502
ILLNOTWO	0.13592	1.3	0.01571	-0.02304	-0.3	-0.00231
INCOME1	.00432***	8.65	0.00045	.00479***	10.68	0.00049
RELATDAI	0.06905	0.64	0.00754	.27345***	4.82	0.034
RELATWEE	.21569***	4.47	0.025	.26968***	5.82	0.03162
RELATMON	.13315***	2.98	0.01423	.21666***	5.36	0.0232
RELATYEA	.10828**	2.44	0.01161	.17456***	4.42	0.01878
FRIENDAI	0.08625	0.69	0.00946	.14582***	2.85	0.01635
FRIENWEE	.21750***	4.65	0.02459	.26582***	6.4	0.03014
FRIENMON	.19573***	4.29	0.02126	.29575***	7.62	0.03239
FRIENYEA	.14487***	2.96	0.01622	.20060***	5.43	0.02274
SPGPWEEK	0.03187	0.82	0.00338	.15239***	5.97	0.01724
SPGPMONT	0.06118	1.21	0.00664	.11016***	3.45	0.01218
SPGPSEV	.07695*	1.67	0.00844	.09346***	3.41	0.01019
SPGPONCE	0.06527	1.39	0.00709	.09800***	3.64	0.01072
CULTGPWE	.67822***	2.63	0.11477	.19797***	4.16	0.02353
CULTGPMO	0.08899	1.64	0.00987	.16498***	4.79	0.01903
CULTGPSE	.13299***	2.89	0.01514	.14931***	5.58	0.01691
CULTGPON	.12515***	3.06	0.0141	.16423***	7.3	0.01867
CHCHGPWE	0.23297	0.67	0.02818	-.12789***	-3.14	-0.01199
CHCHGPMO	-.12946**	-2.57	-0.01225	-.17423***	-5.34	-0.01567
CHCHGPSE	-0.02652	-0.61	-0.0027	-.07994***	-2.84	-0.00773
CHCHGPON	-0.02808	-0.66	-0.00286	-.04330*	-1.74	-0.00429
CIVICGPW	.10111**	1.98	0.01134	.10221***	2.67	0.01128
CIVICGPM	0.05301	1.08	0.00572	.12723***	4	0.01425
CIVICGPS	.16264***	3.87	0.01888	.13946***	5.46	0.01567
CIVICGPO	.09855**	2.54	0.0109	.09307***	4.14	0.01008
POLGPWEE	.27697***	2.72	0.03577	.14692*	1.67	0.01687
POLGPMON	0.09286	1.23	0.01037	0.03135	0.56	0.00328
POLGPSEV	-0.08159	-1.35	-0.00795	-.08466**	-2.03	-0.00809
POLGPONC	0.0307	0.61	0.00326	0.01891	0.61	0.00196
MU(1)	1.32425***	73.34		1.18717***	36.64	
MU(2)	2.63778***	104.8		2.61634***	62.77	